Rabies

EACH YEAR in California, more than 130,000 animal bites are reported to local health departments; of these, approximately 85 percent involve dogs. Even though the incidence of canine rabies in California is low, some 11 percent of the dog bites involve stray dogs and it is these exposures that impose the decision upon the physician of whether he should treat for rabies. The currently approved and commercially available vaccine for use on humans is DEV (Duck Embryo Vaccine). This vaccine, however, has poor antigenicity and some humans manifest sensitivity to the product. As a result of these deficiencies, two tissue culture vaccines, in developmental stages for a number of years, were tried on a group of 31 veterinary students at Ohio State University. Sixteen of the volunteers at random were given the Wistar product (WI-38), a human diploid cell culture, and the rest were given the hamster kidney cell culture (HKCC). Both vaccines were administered intramuscularly in 1 ml doses. The WI-38 product had a potency of 4, the HKCC had a potency of 2.1. Three injections were given over a four-week period. Blood samples were taken before each injection and two weeks after the last injection. High titres developed rapidly in all participants in the experiment with a rapid rise in titre within two weeks after the first injection and a slight increase after the second and third injections. In summary, the two tissue culture vaccines elicited a strong antibody response with minimum side effects.

Another relatively new product available commercially is HRIG (Human Rabies Immune Globulin), which has become available in the last year and a half. This product is intended for use in those persons who are suspected of being (or are) allergic to equine serum and who have incurred a bite or exposure to an animal of a high-risk species. Since HRIG interferes with development of an active immune response to rabies vaccine, the same precautions are advised as for the equine-antirabies-hyperimmune-serum concentrate; that is, seven additional injections of vaccine are required when either the equine or the human product is used. For example, if 14 injections of vaccine, plus boosters at 10 and 20 days following the 14th injection, are planned; then, with use of HRIG, 21 injections are advised—followed by boosters at 10 and 20 days.

The tissue culture vaccines are not available commercially, but in special cases can be obtained from the Center for Disease Control in Atlanta at the request of the California State Health Department in Berkeley. HRIG may be obtained in California from Cutter Laboratories, 2480 B Avenue, San Lorenzo, California 94580.

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Public Health Aspects of Botulism

BOTULISM IS A public health emergency. Whenever a diagnosis of this disease is suspected, local public health disease control officers should be notified immediately.

The production of botulism toxin requires anaerobic conditions, a pH range of 4.6 to 8.6, and time for the organism to multiply and produce the toxin. Toxin can be ingested via contaminated food or absorbed from a wound contaminated with the organism Clostridium botulinum. The toxins usually affecting man are A, B and E.

The incubation period averages 10 to 18 hours. However, it can be as early as five hours and has been reported as late as eight days. The onset will vary with the amount of toxin and individual susceptibility. Twelve hundredths (0.12) gamma of pure toxin is lethal for a 150 pound person.

The first sign of clinical illness is most often a vague feeling of weakness accompanied by general malaise. Visual signs occur next and may include blurring of vision, double vision and eyelid droop. A gradual bilateral symmetrical descending paralysis then occurs. There is no sensory loss in patients; rarely, if ever, is there a fever or elevated pulse (unless a superimposed infection is present), and usually there are no signs of gastrointestinal irritation.

The laboratory diagnosis is made via mouse toxicity testing using a sample of the patient's blood and extracts of the suspected food. The purpose of the testing is to determine which botulism toxin is active and which food is the culprit. Testing of the patient's blood should not play a part in therapeutic management of the patient. It also should not be done as an academic exercise.

If there is a suspicion of botulism, treatment should be started as soon as possible. Trivalent antitoxin (A, B, E) is available through health